Challenges and Prospects for Doubling of Farmers' Income: A study on Awareness and Perception of farmers in Haryana

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Title of the Research

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1. Introduction

Agriculture, with its allied sectors, has sustained its supremacy in terms of employment generation and maintaining the food security of the nation. It caters to almost 70% of rural Indians occupied with it for the sustenance and contributes approximately 16% towards India's Gross Value Added (GVA) at current prices (Indian Economic Survey, 2019; Central Statistics Office, 2019). During the exceptional situation of COVID-19, agriculture and allied sector has emerged as a saviour of the economy that clocked a positive growth of 3.4% during the first quarter of 2020-21 despite the unprecedented downfall in Gross Domestic Product (GDP) of the country (Ministry of Statistics & Programme Implementation, 2020).

It is often argued that any organization cannot sustain for a longer period without any profit. Similarly, the appropriate returns of farmers have greater importance for the prosperity of agriculture. But, a larger majority of the households engaged with agriculture are grappled with low and erratic income (Food and Agriculture Organisation, 2017), the major indicators of agrarian distress (Chand, 2017). Being the largest enterprise, agriculture assumes special attention to improve the condition of more than 140 million Indian farmers (Khanam *et al.*, 2018; Ali, 2018). It is strongly believed that the higher and steady income of the farmers is the only tool to counterbalance the chronic agrarian crisis prevailing in India (Chand, 2017; Suri, 2006). In this context, the former finance minister (Arun Jaitely), during the budget speech in 2016, announced the objective of doubling the income of farmers by 2022, provided 2015-16 as the base year (Khanam *et al.*, 2018), by quoting "*We are grateful to our farmers for being the backbone of the country's food security. We need to think and give back to our farmers a sense of income security. The government will reorient its interventions in the farm and non-*

farm sector to double the income of farmers by 2022". The targeted income comprises the income from both, farm as well as the non-farm activities (Dwivedi *et al.*, 2017). The studies of Chand, 2017; Khanam *et al.*, 2018; Mann *et al*., 2018 stated the objectives of DFI as follows:

- To promote farmers' welfare
- To reduce agrarian distress and
- To reduce the disparity between the income of agricultural and non-agricultural households

Agriculture in Haryana: A Profile

Haryana is an agrarian state that is often considered as the food bowl of India. It is counted among the wealthiest regions in South Asia. It has become a food surplus state and contributes 3.8% towards the National Gross Domestic Product (Economic Survey of Haryana, 2019-20). Being the leading profession, agriculture caters to the livelihood of more than 65% rural population. Approximately 20% of the State Gross Domestic Product (SGDP) comes from the agriculture and allied sector (PHD Chamber of Commerce and Industry, 2019). According the Indian Council of Food and Agriculture, about 86% of the total area in the state is arable, out of which 96% is cultivated. About three fourth share of the total area is irrigated through an exhaustive system of canals and tube-wells. Haryana is one of the leading producers of food-grains in the country. The contribution of the area under wheat and paddy crops to the total gross area sown in the State was 60.34 percent during 2017-18. There are two major cropping seasons in the state namely, Kharif and Rabi. The major Kharif crops are rice, jawar, bajra, maize, cotton, jute, sugarcane, sesame and groundnut, sown in April and May and harvested in November. The major Rabi crops are wheat, tobacco, gram, linseed, rapeseed and mustard, sown in late October early November and harvested in March. The major cropping systems in the state are rice-wheat, cotton-wheat, pearl millet-wheat, cluster bean-raya/wheat, fallow-rapeseed & mustard and sugarcane. The state has contributed significantly towards the green revolution and also blessed with rich livestock resources that supplement the earning of farmers along with cultivation. Crop husbandry and dairy farming are the major contributors to the State Gross Domestic Product (SGDP). A large batch of crops like wheat, paddy, cotton, bajra, mustard and sugarcane offers a substantial prospect for agricultural diversification as well as off-farm opportunities. The state has a good potential for horticulture crops including potato, tomato, onion, chillies, cauliflower, kinnow and guava. Furthermore, there is a friendly environment for allied activities such as agroforestry, dairying, fishery, poultry, apiary and mushroom farming. As of 29th February 2020, 54 Mandis of the state are registered with

Electronic National Agriculture Market, also known as E-NAM, to bring uniformity in agriculture marketing by streamlining of procedures across the integrated markets.

2. Review of Literature

Since the inception of five-year planning, agriculture has witnessed a considerable increase in production because of the greater concentration of previous strategies towards production enhancement (Das and Kumar, 2019; Ali, 2018; Hazra, 2001). During the last five decades, food production has recorded a 3.75 times increase along with a commendable hike (45%) in per person food availability. But, the increased production does not always guarantee a higher income to the farmers (Chand, 2017). Therefore the low level of absolute income along with regular fluctuations has become a natural corollary for the cultivators (FAO, 2017). Birthal *et al.* (2017) found the per capita income of more than 70% of the farmers less than Rs. 15000. In 17 states of India, a median farmer is subsisting with less than Rs. 1700 as average monthly income (Indian Economic Survey, 2015; Sharma, 2018). Furthermore, Alvarage, 2020; Khan *et al.,* 2019 noticed the widespread discrepancies between the income of agricultural and non-agricultural households as a common phenomenon in developing countries. An average farmer of the modern era is surviving on 30-40% of the income earned by an urban non-farm worker (Ali, 2018). The situation of a farmer is quite similar to the cultivator of the 1980s who was living with one-third income as compared to the non-agricultural workers (Chand, 2017). According to the National Crime Record Bureau (NCRB), a significant number of households (10281), about 7.4% of total suicide victims, engaged with the farming sector have quitted their lives during 2019. Studies by Datta *et al.*, 2018; Pandey *et al.*, 2018; Sadanandan, 2014 referred to the epidemic of farmers' suicide as a decadal phenomenon that unveils the stress of the farming community.

A large bunch of farmers is engaged with agriculture just because of the lesser skills beyond farming and willing to migrate if provided an option (Sharma, 2019; Agarwal and Agarwal, 2017; Ranganathan, 2015; Suri, 2006). Poor socio-economic conditions and unhealthy enabling environment for the sector not only demoralize the interest of youth but also create dissatisfaction among the existing peasants (Ali, 2018; Mann *et al*.,2018; Khanam *et al.,* 2018; Pattnaik *et al.,* 2017; Chand *et al.,* 2015). Such dissent of farmers from their occupation hinders the long term investment in agriculture (Agarwal and Agarwal, 2017; Chand, 2017).

2.1 Agricultural Household

There is no specific definition of agricultural households. According to the Situation Assessment Survey of 2003, a farmer was a person who possessed some land and was involved

with agricultural activities on that land during the last 365 days. The survey considered a family, having at least one farmer member, as a farmer household. Whereas the Situation Assessment Survey of 2013 defined agricultural households as a household earning more than Rs. 3000 from agricultural activities and at least one member of the family is employed in agriculture, irrespective of the status of occupation either primary or subsidiary, during the last 365 days. The survey alienated the condition of land possession. Similarly, the National Bank for Agricultural and Rural Development (NABARD) in its survey named "NABARD All India Rural Financial Inclusion Survey 2016-17" (NAFIS) did not mention any condition about the possession of the land. The survey considered a household as an agricultural household if it is earning more than Rs. 5000 and at least one member is engaged in agricultural activities. Status of employment may be principal or subsidiary but an additional condition of minimum produce value of Rs. 5000 is implied to eliminate the households conducting insignificant agricultural activities. Despite the disparity in the definition of "Agricultural Household", there is a similarity between all the surveys about the scope of agricultural activities. These activities are not just limited to the cultivation of field crops but also include other activities like animal husbandry, horticulture, beekeeping, poultry, fishery and plantation. The farmers are classified into 5 classes based on operational landholdings.

Classes of Farmers	**Operational Landholdings (in hectares)**
Marginal	0-1
Small	1-2
Semi-medium	2-4
Medium	4-10
Large	10 and above

(Source: Agricultural Census, 2015-16)

All the other households, except agricultural households, will be considered as "Non-Agricultural Households" (NAFIS, 2016-17).

2.2 Farmers' Income

As per the Committee on Doubling Farmers' Income (DFI Committee), "net return is a function of gross return minus the cost of production". Gross Farm Income (GFI) comprises the total value of agricultural output and the payments of government to the farmers through farm programmes (United States Department of Agriculture). Net Farm Income can be calculated by subtracting farm expenses from GFI. However, the target of DFI is to double the total

income of farm households that comprises income from cultivation, livestock, nonfarm business, wages and salary (Ranganathan, 2015).

2.3 Doubling Farmers' Income by 2022-23: The Framework

In April 2016, an inter-ministerial committee (DFI Committee) was framed to look out the issues regarding DFI to recommend the strategies to attain the objectives. The committee derived three broad variables namely, enhancement of productivity, cost reduction and remunerative prices from the basic equation of economics (Net Returns= Gross Returns – Cost of Production). According to the DFI Committee and Ministry of Agriculture & Farmers Welfare, the basic manifesto of the strategy is directed by the following concerns/issues:

- Optimal monetization of farmers' produce
- Sustainability of production
- Improved resource use efficiency
- Re-strengthening of extension and knowledge-based services and
- Risk management.

2.3.1 Seven Points Strategy

As per the committee, the strategy of DFI comprises seven critical sources of growth and also known as Seven Point Strategy. It revolves around the identified by Chand (2017)operating within or outside agriculture. The sources of growth lying within agriculture are:

i. Increase in productivity
ii. Reducing the cost of production
iii. Increasing crop intensity
iv. Diversification towards high value crops

Sources of growth outside agriculture include better price realization to the farmers and shifting them to the non-farm and subsidiary activities. Allied activities comprise horticulture, poultry, fisheries, beekeeping, agroforestry, white revolution, blue revolution, dairy development, integrated farming and rural backyard poultry development.

2.3.2 The 16 Points Action Plan

By the same token, the finance minister (Nirmala Sitharaman) proposed 16 Points Action Plan during the budgetary session in February 2020. The government allocated Rs. 2.83 lac crores for the sectors including agriculture, allied activities, irrigation and rural development for the financial year 2020-21. The plan comprises the following points:

i. To encourage the states who undertake the implementation of following model laws issued by the central government
    - Model Agricultural land Leasing Act, 2016

- Model Agricultural Produce and Livestock Marketing Act, 2017
- Model Agricultural Produce and Livestock Contract Farming Act, 2018
- Service Promotion and Facilitation Act, 2018

ii. Comprehensive measures for 100 water-stressed districts

iii. Expansion of the Pradhan Mantri Kisan Urja Suraksha evam Uttam Mahabhiyan (PM-KUSUM) scheme

iv. To encourage the balanced use of all kinds of fertilizers by changing the prevailing incentive regime causing excessive use of chemical fertilizers

v. To provide viability funding for setting up cold storage warehouses at block or taluk level

vi. Promoting Self Help Groups (SHGs), specially the women SHGs, by availing the assistance through MUDRA and NABARD

vii. To build a seamless national cold supply chain for the perishables

viii. To encourage the focus of states towards one product one district

ix. To expand the Integrated Farming System in rain-fed areas

x. To integrate the Electronic Negotiable Warehousing Receipts (E-NWR) with Electronic National Agriculture Market (E-NAM)

xi. To expand the agricultural credit availability through the NABARD refinance scheme

xii. To eliminate the foot and mouth disease Brucellosis in cattle and Peste des petits ruminants (PPR) in sheeps

xiii. Blue Economy

xiv. Raising fish production

xv. Promoting the growing of algae, seaweed and cage culture

xvi. Further expansion of SHGs under Deen Dayal Antyodaya Yojana for alleviating the poverty

2.4 DFI: Has it happened before?

The literature shows the evidence of doubling of farmers' income, in nominal terms, in a smaller time of five to seven years, during last three decades, from 1987-88 to 1992-93, 2004-05 to 2009-10 (Chand, 2017) and 2006-07 to 2013-14 (Singh *et al.*, 2018). In this regard, Singh *et al.* (2018) reported another important finding that the majority of income doubled states were relatively less productive in the base year as compared to the states with higher productivity. Likewise, Chandrasekhar and Mehrotra (2016) also did not find the traces of DFI, in real terms,

between 2003 and 2013. Chand (2017) reported that the real income of farmers was doubled between a longer period of 22 years from 1993-94 to 2015-16. So, the objective of DFI by 2022-23 would require a higher pace of growth (Mann *et al.*, 2018), more than 10% per annum (Gulati, 2019; Chand, 2017; Waghmare, 2016), in farmers' income but it is achievable (Rao *et al.*, 2017).

2.5 Challenges to DFI

India is a self-sufficient economy in terms of food security (Mukherjee *et al.*, 2020) and counted among the largest exporters of agricultural produce. But, it is passing through serious agrarian distress despite higher production. Various studies (Sharma, 2019; Sharma, 2018; Mann *et al*., 2018; Gulati, 2018; Kumar and Chahal, 2018; Swaminathan, 2018; Agarwal and Agarwal, 2017; Dwivedi *et al*., 2017; Narula *et al.*, 2011; Suri, 2006) have been conducted to bring deeper insights about the poor condition of the cultivator, also referred as the *Annadata*. As per the DFI Committee, farmers are encompassed by the twin perils named as uncertainties of the production environment and the complexities of market forces. Climate change has become a catastrophic challenge in the way of "Doubling the income of farmers" (Swaminathan, 2018; Thornton *et al.*, 2018; Dwivedi *et al*. 2017). Specially, the major parts of Uttar Pradesh, Madhya Pradesh, Rajasthan, Gujarat, Punjab and Haryana are highly sensitive to climate change (Hochrainer *et al*., 2010). According to the Composite Water Management Index released by NITI Aayog in 2019, India is ranked 120th among 122 countries in terms of quality of water and grappling with a serious issue of the water crisis. The disaster is also accompanied by the increasing frequency of droughts and the unsustainable depletion of groundwater.

The growing regional disparity has become a notable feature of Indian agriculture (Ali, 2018). The Trans-Gangetic plain zone of India, one of the highly productive area, is facing discomposure in agro-ecosystem due to stagnancy in the yield level of wheat and rice along with the diminishing trend of profit (Singh *et al.*, 2018). Ali *et al.* (2012) also reported a stagnancy in the productivity of rice and wheat despite the increased use of fertilizers and other inputs. Despite having a rich diversity (Singh *et al*., 2018) and huge potential for agriculture, the north-eastern region is a laggard in terms of growth due to the irrational use of land resources, poor infrastructure, deficiency of fertilizers and quality seeds (Ray *et al.*, 2018). Apart from the several uncertainties caused by nature, various other factors such that infrastructure, marketing, technology and governance also have a significant influence on agriculture. John F Kennedy rightly quoted the farmer as the only person who buys everything in retail, sells everything at wholesale and pays the freight both ways.

Out of 140 million farmers, 80% are marginal in nature (Ali, 2018) and operating on the smaller pieces of land. The widespread land fragmentation directly hits the profit efficiency of such farmers in terms of increased costs of the inputs (Manjunatha *et al.*, 2013). Moreover, Raghuram (2020) noted a spontaneous rise in the gap between input costs and the realization of the price by the farmers. They are not getting remunerative prices for their produce (Mann *et al*., 2018) because of the poor marketing infrastructure. Only 6% of the total farmers are getting benefitted through the minimum support price (Sharma, 2018). Particularly, the farmers operating on a smaller piece of land are not benefitted by the interventions like MSP because of the smaller volumes of produce, increased transportation costs and inability to negotiate the price. Generally, the farmers depend upon the local suppliers and middlemen for the inputs (Sinha *et al., 2019*) and used to sell their produce to them. But, the limited information of the farmers about prices, consumers and demand is the major cause behind their exploitation by intermediaries (Narula *et al.,* 2011). Moreover, the inefficient governance regarding the cost of inputs resulted in compressed margins to the farmers that make them look at the moneylenders to meet further credit requirements (Sharma, 2019; Kumar and Chahal, 2018; Waghmare, 2016). Furthermore, Chikara and Kodan (2014) found a negative relationship between informal borrowings and the size of landholdings that indicates the higher dependency of marginal farmers towards the informal sources of credit.

Suri (2006) postulated the contradiction between the interests of farmers and their political representatives as the major factor behind the negligence of the agriculture sector. Usually, the Government uses loan waiver schemes as a measure to cope with the increasing incidents of default in payment of loans from the farmers. In this context, Jain and Raju (2011) conducted a study to identify the determinants of duration of credit overdue and to understand farmers' perception regarding the loan waiver scheme. For this purpose primary data was collected from 376 farmers of Mahendergarh, Hisar and Karnal districts of Haryana based on agricultural performance**.** The results reported crop failure and family health problems as the main causes of default in loan repayment by 95 percent of the farmers. Expenditure on the education of children was another significant reason for default. It was found that the farmers with lesser overall income, younger age, lesser education, smaller farm size and higher loan amount are more likely to default.

2.6 Opinions and Suggestions of Various Researchers

The singular concentration on cultivation concerning DFI would not be sufficient because a large number of farm households is involved with various other activities along with farming (Chandrasekhar and Mehrotra, 2016). Chand (2017) found that the farmers who also have some

other sources of non-farm income are relatively less indebted in comparison to the farmers who had reported agriculture as their principal source of income. According to the Department of Animal Husbandry and Dairying, the livestock sector can play a pivotal role in bringing sustainability in the agriculture system by offering alternatives in extreme weather conditions. One-fourth of the total rural households, specifically the marginal and small farmers operating on less than 2 hectares of land, is catering to a large number of total goats in the country (Singh *et al.* 2018).

A plethora of studies (Bathla, 2018; Kumar and Chahal, 2018; Khanam *et al.*, 2018; Ali, 2018; Ray *et al.*, 2018; Sharma and Rajan, 2018; Mashelkar, 2018; Reddy *et al.*, 2018; Sendhil *et al.*, 2017; Rao *et al.*, 2017; Tomer *et al.*, 2016; Chandrasekhar and Mehrotra, 2016; Kornginnaya, 2013) have suggested different measures to enhance the earning of the cultivators. Rao *et al.* (2017) indicated the possibility of doubling the income of farmers through the adoption of farmer specific approach to increase the production and emphasized the involvement of weed management as an important ingredient of strategy for DFI. But the higher productivity, without a sound domestic as well as an export market, can generate surplus produce that would squeeze the margin of profit to the farmers (Gulati, 2019). Mohapatra *et al*. (2017) did not found any influential increment in the income of the vegetable farmers in Punjab despite higher production and productivity because of the deficient infrastructure, particularly for post-harvest handling activities. Higher Minimum Support Price (MSP) along with improved procurement can be used as the tool to improve the condition of the farmers (Sharma, 2019). Arrangement of appropriate returns of farmers through direct purchase of their produce would assist in assuring higher income to them (Ali, 2018). Fang *et al.* (2013) indicated the possibility of such arrangements through the establishment of farmers' markets to provide a more profitable venue that would enable the local farmers to directly trade with the potential consumers. Tomer *et al.* (2016) highlighted the need for an effective communication channel to improve the accessibility of information among farmers. MP and Mathur (2018) highlighted the suitability of Farmer Producer Organisations (FPOs) for the wellbeing of the small and marginal farmers through the reduction in overall cost and ensuring a better remuneration for their produce. Kornginnaya (2013) conducted an empirical study on 100 farmers of Karnataka and found the participatory labor techniques a helping hand for the small farmers to bring affordability in important farm activities.

By referring to the More from Less for More (MLM) paradigm, Mashelkar (2018) argued the need for innovation-led agriculture to get more output through limited resources. Gore (2018) mentioned that the escalation of technology and innovation would bring sustainability along

with enhanced production. Lately, the researchers have observed a phenomenal stride of innovation in agricultural production, enhancing productivity and preserving the environment (Shivay and Singh, 2018). The studies of Shivay and Singh 2018; Mashelkar, 2018 identified various system-based technologies like Genetically Modified Crops (GMCs), crop diversification, integrated farming system, conservation agriculture, climate-smart cropping and integrated crop management to make most from the limited resources.

Undoubtedly, agriculture would not have evidenced such phenomenal progress without the innovations in technologies (El Titi, 1992). But, the production-centric strategies in the past have resulted in an excessive burden on natural resources (Abrol and Sangar, 2006). A shift from prevalent agricultural practices has become a necessary phenomenon for the preservation of the environment (Bhan and Behera, 2014). Conservation Agriculture is a sustainable agriculture production system that suits the local conditions to protect scarce resources such as soil, air and water (European Conservation Agriculture Federation). Many of the earlier studies highlighted the need for diversification towards high-value crops. Crop diversification offers a wider spectrum of crops to the farmers to decrease the risk of uncertainties (Hazra, 2001). Tripathi (2020) stated the promotion of diversification as a need rather than to be an amenity. It has become more critical for some north-western states (including Haryana, Punjab and some parts of Uttar Pradesh) which are known for the significant contribution towards the green revolution in the past (Khanam *et al.*, 2018). The diversification could be used as a tool to tackle the seasonal variability of farmers' income (Ogundari, 2013). Shivay and Singh (2018) stated the two types of diversification- horizontal and vertical. Horizontal diversification comprises crop intensification and crop substitution whereas vertical diversification is concerned with value addition to the product through processing. Bhalla and Singh (2009) noted a nationwide diversification from coarse cereals to high-value food-grains like wheat and rice. Coarse cereals like millet (Bajra), can be grown in adverse climatic conditions, offer alternatives in dynamic weather conditions (Reddy *et al.*, 2018). Bhattacharyya (2008) argued that the proper diversification would boost the income along with the protection of precious natural resources like soil and water.

Some researchers provided certain suggestions for the farmers to strengthen their position on their own. The reliance of farmers on individual components rather than an integrated approach to farming (Gill *et al.*, 2009) is subjected to a high degree of uncertainty in income and employment. Kirsten and Sartorius (2002) stated the need for a customer-oriented approach among farmers about the selection of the crops. Ray *et al.* (2018) suggested that the appropriate selection of crops, scientific land use and better management practices will help elevate the

income to the farmers. Ponnusamy and Devi (2017) observed the higher inclination of farmers towards the allied activities in Haryana and Tamilnadu for the last two decades. Ali (2018) recognized that the allied activities like horticulture, fisheries and bee-keeping can significantly contribute towards the consolidation of earnings to the farmers. Brumfield *et al.* (2000) conducted the cost-benefit analysis of Integrated Crop Management (ICM) through budgeting methods and postulated that the ICM approach may diminish the earning of farmers in terms of increased expenses but favorably influence the environment and society through the reduction in the use of fertilizers and the health issues among farmers.

According to the Model Contract Farming Act 2018, the essence of contract farming lies in the pre-production agreement between farmers and sponsors to transfer the risks of market uncertainties to the latter. Contract farming (CF) has resulted in more income to the cultivators (Singh, 2002) but the impact of CF is not so appreciable (Henningsen *et al.*, 2015) because of the minute participation of the poorest farmers which is the real concern for ensuring their welfare (Ton *et al.*, 2018). Therefore, the role of public and institutional support becomes indispensable to determine the welfare of the poorest on a larger scale (Qaim, 2009).

Recently, several steps have been taken for ensuring the sustainable development of agriculture by considering the various aspects like improving soil fertility, enhancing productivity, boosting the production, risk coverage, easy availability of credit and consolidating the irrigation system. Soil health cards contain specific recommendations regarding soil nutrients and the use of fertilizers to assist the farmers in improving productivity as well as soil health. The government has also initiated Neem Coated Urea (NCU) Scheme to boost the growth of wheat and paddy and to eliminate the black marketing of urea by mandating that the manufacturers cannot sell NCU at a price not more than 5% above the maximum retail price to cover the cost of coating. Pradhan Mantri Fasal Bima Yojna (2016) is focused on covering the risk and providing security to the farmers against the exploitation by private moneylenders. Paramparagat Krishi Vikas Yojana emphasizes on improving soil health and organic matter content to consolidate the income of farmers by realizing premium prices. Bhavantar Bharpai Yojna protects the interests of farmers engaged with horticulture through price fixation for various vegetable and fruit crops. Pradhan Mantri Krishi Sinchai Yojana aims to provide improved access to irrigation and enhanced water efficiency. Pradhan Mantri Kisan Samman Niddhi (PM-KISAN) Yojana is another major initiative of the government to bring stability to the income by providing income support of Rs.6000/- per year in three equal installments to small and marginal farmer families having combined landholding up to 2 hectares. The government will finance 20 lacs farmers to establish solar tube-wells on barren land under

Pradhan Mantri Kisan Urja Suraksha evam Uttam Mahabhiyan (PM-KUSUM) scheme. The government is acknowledging the Electronic National Agriculture Market (E-NAM) as a milestone to boost the income of farmers by bringing uniformity in the markets across the nation. Definitely such measures help in improving the lives of farmers but real success of these measures would require a sound implementation system.

Like any other sector investment is the key factor for making the agriculture an effective occupation. Mann *et al.* (2018) highlighted the need for investment in cold storage and food processing to bring agility in post-production activities. Prioritized investment in underdeveloped areas would generate higher returns as the extra unit of capital is employed (Bathla, 2017). Technology-enabled supply chain system, the sound public distribution system and the use of collective intelligence of the grass-root farmers for improving the productivity of workers might be the significant contributors in improving the financial immunity of the farmers (Mashelkar, 2018). The development of the value chain would significantly contribute to job creation in the non-farm sector in rural areas (Gulati, 2016). Increased opportunities for employment in off-farm activities helps in reducing the burden of the excessive workforce on agriculture (Birthal *et al.*, 2017). Some researchers (Mashelkar, 2018; Gore, 2018; Shivay and Singh, 2018) suggested the innovation in technology as the key factor for the realization of the objectives of DFI. However, Sendhil *et al.* (2017) emphasized on the consolidation of the gains through prevailing technology and supplement policies rather than harnessing new science or research to address the objective of DFI within a specified time. Aspiring targets like doubling the income of the farmers would require collaborative efforts of all stakeholders (i.e. government, farmers, non-government institutions, industry) associated with agriculture (Ali, 2018). Although the views of experts regarding the achievement of DFI by 2022 are divided into two factions as it would require an unprecedented growth rate. Some researchers (Gulati, 2019; Waghmare, 2016) referred to the realization of DFI as the miracle of miracles whereas the others (Khanan, 2018; Chand, 2017; Rao *et al.*, 2017) are hopeful about the same through the integration of resources within as well as outside the agriculture.

3. Research Gap

The literature review indicated that numerous studies had been conducted on issues like farmers' suicides, farmers' indebtedness, etc. But the number decreases when it comes to the income of farmers. Apart from the study conducted by Chand (2017), most of the researchers just have expressed their opinions about the attainability of the Government's target to double the income of farmers by 2022-23 based on the past performance of the agriculture sector. Furthermore, some researchers have also provided their views about the possibilities of

enhancing the farmers' income. But the farmer himself is the only person who can bring out the true picture of the real issues of his community than anyone else. The experiences of other stakeholders i.e. Aarthiyas, farmer cooperatives, input distributors, etc. can also provide valuable insights for ensuring the wellbeing of farmers.

4. Relevance and Scope of the Study

The study lays its foundation from the nationwide study conducted by Chand, 2017. By considering the suggestions of adopting farmer specific approach (Rao *et al.*, 2017) the scope of the study is kept limited to one state (Haryana) only. The data will be collected from farmers as well as the other stakeholders related to agriculture. The rationale behind choosing Haryana as the target population lies in the better infrastructure as well as the promising performance of the agriculture sector in the past.

It is often argued that the agriculture sector has to be more competent to compile with the increased demand for food in the future. The study will bring a better understanding of the concerned issue to the policymakers by providing them the valuable experiences and perspectives of the farmers in order to strengthen their earnings.

5. Objectives of the Study

1. To study the awareness among farmers about the schemes related to doubling of farmers' income.
2. To know the perception of selected farmers and other associated stakeholders about doubling of farmers' income.
3. To identify the challenges faced by farmers regarding the implementation of schemes related to DFI.

6.Research Methodology

Population

This study will be conducted in Haryana only. Farmers as well as the other stakeholders associated with agriculture will be the target population.

Sample size

Approximately 700 respondents will be selected from the total population.

Research design

Exploratory-cum-descriptive research design will be used in the proposed study.

Instrument

Primary data will be collected through structured questionnaire.

Sampling technique

This study will use stratified random sampling method for data collection.

Statistical techniques

This study will use the statistical techniques i.e. correlation, regression, factor analysis etc. as per the suitability for the proposed study.

7. Chapter plan

1. **Introduction**
   -This chapter will provide a brief introduction and historical background of this topic.
2. **Review of literature**

   -This chapter will include a review of available literature on the doubling of farmers' income.

3. **Research methodology**

   -This chapter shall include a description of the population, sampling procedure, data collection method, statistical tools and techniques.

4. **Analysis and interpretation**
   -This section will include the analysis and interpretation of data to accomplish underlined objectives.
5. **Finding, conclusion and suggestion**
   -This chapter will include findings of the study, conclusion and suggestions for policymakers

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   Appendix

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Signature of Supervisor Signature of Candidate

Signature of Director